1. A method of forming a probe tip, comprising the steps of:

providing a probe tip support member;

directing a charged particle beam activated gaseous material toward a surface of said probe tip support member; and

scanning a charged particle beam over said surface, the charged particle beam inducing a reaction with the charged particle beam activated gas to deposit a catalyst layer, said catalyst layer comprising a material capable of catalyzing the growth of a nanotube; and

growing a nanotube on the catalyst layer in a process catalyzed by said material.

2. The method of claim 1 in which providing a probe tip support member comprises providing a probe tip support member having at one end a substantially planar surface.

3. The method of claim 1 wherein said catalyst layer has a substantially non-uniform thickness.

4. The method of claim 1 wherein said catalyst layer has a substantially planar surface which is not parallel to the planar surface of said probe tip support member.

5. The method of claim 4 wherein said nanotube extends in a direction substantially perpendicular to the surface of said catalyst layer.

6. The method of claim 2 in which providing a probe tip support member comprises providing a support of a first material and depositing a layer of a second material onto a surface of said support.

7. The method of claim 6 in which depositing said catalyst layer comprises depositing said catalyst layer onto said layer of a second material.

8. The method of claim 6 wherein said layer of a second material has a substantially non-uniform thickness.

9. The method of claim 6 wherein said layer of a second material has a substantially planar surface which is not parallel to the planar surface of said probe tip support member.

10. The method of claim 9 wherein said nanotube extends in a direction substantially perpendicular to the surface of said catalyst layer.

11. The method of claim 1 in which providing a probe tip support member comprises providing a probe tip support member having at one end a substantially planar surface by cutting a tapering probe tip support member at a position to provide a substantially planar surface of a particular size.

12. The method of claim 11 in which cutting a tapering probe tip support member at a position to provide a substantially planar surface of a particular size comprises charged particle beam milling.

13. The method of claim 1 in which said charged particle beam activated gaseous material comprises an electron beam activated gaseous material and in scanning a charged particle beam over said planar surface comprises scanning an electron beam over said planar surface.

14. The method of claim 1, wherein said material capable of catalyzing the growth of a nanotube comprises cobalt, metallic nickel, a nickel oxide, metallic iron or an iron oxide.

15. A probe tip, comprising:

a support including a shaped tip having a substantially planar end;

a first catalyzing layer of material capable of catalyzing growth of a nanotube covering a first portion of the surface of said planar end, said first catalyzing layer having a substantially non-uniform thickness; and

a first nanotube formed on said first catalyzing layer.

16. The probe tip of claim 15 wherein said first catalyzing layer has a diameter of 5 to 25 nm.

17. The probe tip of claim 15 further comprising one or more additional nanotubes formed on said first catalyzing layer.

18. The probe tip of claim 15 wherein said first catalyzing layer has a substantially planar surface which is not parallel to the planar end of said support.

19. The probe tip of claim 18 wherein said nanotube extends in a direction substantially perpendicular to the surface of said first catalyzing layer.

20. The probe tip of claim 15 further comprising:

a second catalyzing layer of material capable of catalyzing growth of a nanotube covering a second portion of the surface of said planar end; and

a second nanotube formed on said second catalyzing layer.

21. The probe tip of claim 20 wherein said first catalyzing layer and said second catalyzing layer are spaced apart.

22. The probe tip of claim 18 further comprising:

a second catalyzing layer of material capable of catalyzing growth of a nanotube covering a second portion of the surface of said planar end;

said second catalyzing layer having a substantially planar surface which is not parallel to the surface of said first catalyzing layer.

23. A probe tip assembly, comprising:

a support including a shaped tip having a planar end and sidewalls sloping from said planar end;

said support having a longitudinal axis running from the shaped tip through the center of the support and wherein the surface of the planar end is not perpendicular to the longitudinal axis;

a catalyzing layer of material capable of catalyzing growth of carbon nanotubes covering a portion of the surface of said planar end but not on said sidewalls; and

a single carbon nanotube formed on said catalyzing layer.

24. The probe tip assembly of claim 1, wherein said nanotube is a multi-wall nanotube.

25. The probe tip assembly of claim 1, wherein said material comprises cobalt, metallic nickel, a nickel oxide, metallic iron or an iron oxide.

26. The probe tip assembly of claim 1, wherein said planar end has a minimum lateral extent of between about 15 nm and about 300 nm.

27. A method of forming a probe tip, comprising the steps of:

providing a probe tip support member having at one end a substantially planar surface;

said probe tip support member formed by flattening an end of a tapering probe tip support member using charged particle beam milling in order to provide a substantially planar surface of a particular size;

depositing a catalyst on said planar surface, said catalyst comprising a material capable of catalyzing the growth of a nanotube; and

growing a nanotube on the catalyst in a process catalyzed by said material.

28. The method of claim 27 in which in which providing a probe tip support member having at one end a substantially planar surface includes providing a support member having sidewalls that slope away from the planar surface.

29. The method of claim 28 in which providing a probe tip support includes providing a support member in the form of a truncated cone.

30. The method of claim 28 in which providing a probe tip support member includes cutting a tapering probe tip support member to provide a first surface having a desired diameter and angle for growing a nanotube.

31. The method of claim 28 in which depositing a catalyst on said planar surface includes:

anisotropically depositing a catalytic material onto the planar surface and the sidewalls; and

etching said catalytic material to remove said catalytic material from the sidewalls while leaving a thickness of the catalytic material on the planar surface.

32. The method of claim 27 in which depositing a catalyst on the planar surface further comprises:

directing a charged particle beam activated gaseous material toward said planar surface; and

scanning a charged particle beam over said planar surface, the charged particle beam inducing a reaction with the charged particle beam activated gas to deposit a catalyst on the planar surface, said catalyst comprising a material capable of catalyzing the growth of a nanotube.

33. The method of claim 32 in which said charged particle beam activated gaseous material comprises an electron beam activated gaseous material and in scanning a charged particle beam over said planar surface comprises scanning an electron beam over said planar surface.

34. A method of forming a probe tip, comprising the steps of:

providing a probe tip support member having at one end a substantially planar surface;

said probe tip support member formed by cutting a tapering probe tip support member at a position to provide a substantially planar surface of a particular size;

said probe tip support having a longitudinal axis running from the planar surface of said support through the center of said support and in which cutting the tapering probe tip support member at a position to provide a planar surface of a desired size includes cutting the probe tip support member to provide a planar surface that is not perpendicular to the longitudinal axis;

depositing a catalyst on said planar surface, said catalyst comprising a material capable of catalyzing the growth of a nanotube; and

growing a nanotube on the catalyst in a process catalyzed by said material.

35. The method of claim 34 in which in which providing a probe tip support member having at one end a substantially planar surface includes providing a support member having sidewalls that slope away from the planar surface.

36. The method of claim 35 in which providing a probe tip support includes providing a support member in the form of a truncated cone.

37. The method of claim 35 in which providing a probe tip support member includes cutting a tapering probe tip support member to provide a first surface having a desired diameter and angle for growing a nanotube.

38. The method of claim 35 in which depositing a catalyst on said planar surface includes:

anisotropically depositing a catalytic material onto the planar surface and the sidewalls; and

etching said catalytic material to remove said catalytic material from the sidewalls while leaving a thickness of the catalytic material on the planar surface.

39. The method of claim 34 in which depositing a catalyst on the planar surface further comprises:

directing a charged particle beam activated gaseous material toward said planar surface; and

scanning a charged particle beam over said planar surface, the charged particle beam inducing a reaction with the charged particle beam activated gas to deposit a catalyst on the planar surface, said catalyst comprising a material capable of catalyzing the growth of a nanotube.

40. The method of claim 39 in which said charged particle beam activated gaseous material comprises an electron beam activated gaseous material and in scanning a charged particle beam over said planar surface comprises scanning an electron beam over said planar surface.

41. A probe tip assembly formed in accordance with the method of claim 34.